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REMARKS

Claims 1-2, 5-8, 11-12, 15-18 and 21-26 are pending in this application. For purposes of expedition, claims 3-4, 9-10, 13-14 and 19-20 have been canceled without prejudice or disclaimer. Claims 1-2, 5-8, 11-12 and 15-18 have been amended in several particulars for purposes of clarity and brevity that are unrelated to patentability and prior art rejections while Claims 21-26 have been newly added in accordance with current Office policy, to further and alternatively define Applicants' disclosed invention and to assist the Examiner to expedite compact prosecution of the instant application.

Claims 1-20 have been rejected under 35 U.S.C. §102(b) as being anticipated by Yura, U.S. Patent No. 5,821,727 for reasons stated on pages 2-3 of the Office Action (Paper No. 6). As previously discussed, claims 3-4, 9-10, 13-14 and 19-20 have been canceled without prejudice or disclaimer. To the extent that the rejection remains applicable to claims 1-2, 5-8, 11-12 and 15-18, Applicants respectfully submit that key features of Applicants' base claims 1 and 11are **not** disclosed or suggested by Yura '727, and request the Examiner to reconsider and withdraw this rejection for the following reasons.

Claim 1, as amended, defines an inverter apparatus for converting a DC power from an input AC power to an output AC power having a variable frequency and a variable electric power to drive an induction motor at a variable speed, comprising:

> a rectifying unit for converting an input AC power to a DC power, a filter capacitor for smoothing the DC power outputted from said rectifying unit, an inverter unit having an input connected across said filter capacitor, a motor current detector for detecting a motor current

outputted from said inverter unit and a gate circuit for driving said inverter unit;

an excitation detection unit for detecting an excitation current of said induction motor from an output of said motor current detector and a reference phase command;

a setting unit for setting a limitation level of said excitation current;

a torque boost voltage command unit for producing a torque boost voltage command according to an inverter frequency command; and

a torque boost voltage compensation unit for changing said torque boost voltage command so that the detected excitation current value is smaller than or equal to said limitation level.

Similarly, base claim 11 defines the same inverter apparatus broadly in terms of means-plus-function limitations.

As expressly defined in each of Applicants' base claims 1 and 11, the key features are the "torque boost voltage command unit for producing a torque boost voltage command according to an inverter frequency command" and the "torque boost voltage compensation unit for changing said torque boost voltage command so that the detected excitation current value is smaller than or equal to said limitation level." According to Applicants' disclosure, the "torque boost" means increasing the torque by increasing the inverter output voltage. Since the torque boost voltage can be adjusted [automatically] so that the excitation current is smaller than or equal to the limitation level, [even when the torque boost voltage is set up to be large] over-excitation in light load can be prevented. Moreover, since the torque boost voltage can be set up to be high, large start torque can be obtained even in heavy load. See page 15 of Applicants' specification.

In contrast to Applicants' claims 1 and 11, Yura '727 discloses an induction motor control unit as shown in FIG. 1, designed to control a revolutional speed of an induction motor without a speed detector. However, the design has a completely

different set of circuit components. As shown in FIG. 1, the induction motor control unit comprises a two-phsae sinusoidal wave generator 22 to generate sin ωt and cose ωt; a two-phase-to-three-phase converter 3 to calculate an excitation current and torque current using instantaneous values of motor currents iu, iv and iw, which are obtained via current detectors 4a, 4b and 4c as well as signals of sin ωt and cose ωt; a three-phase-to-two-phase converter 16 to calculate a motor terminal voltage using signal phases of sin ωt and cose ωt as reference phases and three-phase motor currents. Other auxiliary circuit elements are also required, including, for example, a first subtractor 8, a first error amplifier 9, a second subtractor 1, a second error amplifier 2, a third subtractor 5, a third error amplifier 12, a fourth error amplifier 23, a slip frequency estimator 6 and 7 and a revolutional speed estimator 19 and 20.

Yura '727 does **not** disclose the inverter apparatus of Applicants' base claims 1 and 11, including key features, such as, the "torque boost voltage command unit for producing a torque boost voltage command according to an inverter frequency command" and the "torque boost voltage compensation unit for changing said torque boost voltage command so that the detected excitation current value is smaller than or equal to said limitation level."

Nevertheless, the Examiner cites the substrater 5, as shown in FIG. 1 of Yura '727 as Applicants' claimed "torque boost voltage compensation unit for changing said torque boost voltage command so that said detected excitation current value is smaller than or equal to said limitation level" as generally defined in Applicants' base claims 1 and 11.

However, this citation is misplaced and is factually incorrect. According to Yura '727, the subtracter 5, as shown in FIG. 1, is used to subtract the excitation current value from an excitation current command based on the magnetic induction command in order to obtain an error between iq* and iq and the torque current error amplifier 12. In Yura '727, the voltage command eq* is changed in accordance with the error between the torque current command iq* and the torque current iq.

However, in contrast to Yura '727, Applicants' base claims 1 and 11 expressly require that the torque boost voltage (Vq* at the end) is changed so that the excitation current may be equal to or less than a limitation level, which is completely different from Yura '727.

In addition, the Examiner also cites the subtracter 1, as shown in FIG. 1 of Yura '727 as Applicants' claimed "torque boost voltage command unit for producing a torque boost command in response to a frequency command of said inverter apparatus" as generally defined in Applicants' base claims 1 and 11.

Again, this citation is also misplaced and factually incorrect. According to Yura '727, the subtracter 1, as shown in FIG. 1, is used to obtain an error between frequency command and motor revolutional speed and the amplifier 2 which outputs iq*. What is accomplished in Yura '727 is that the speed error (ωm*- ωm^) is amplified to calculate iq*.

In contrast to Yura '727, Applicants' claimed "torque boost command" is produced in accordance with the frequency command ω1* and the calculated torque boost command ω1* as directly added to the voltage command Vq* without going through current control unlike Yura '727 (see element 12, shown in FIG. 1).

The rule under 35 U.S.C. §102 is well settled that anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. In re Paulsen, 30 F.3d 1475, 31 USPQ2d 1671 (Fed. Cir. 1994); In re Spada, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990). Those elements must either be inherent or disclosed expressly and must be arranged as in the claim. Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989); Constant v. Advanced Micro-Devices, Inc., 848 F.2d 1560, 7 USPQ2d 1057 (Fed. Cir. 1988); Verdegall Bros., Inc. v. Union Oil Co., 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987). The corollary of that rule is that absence from the reference of any claimed element negates anticipation. Kloster Speedsteel AB v. Crucible Inc., 793 F.2d 1565, 230 USPQ2d 81 (Fed. Cir. 1986).

The burden of establishing a basis for denying patentability of a claimed invention rests upon the Examiner. The limitations required by the claims cannot be ignored. See In re Wilson, 424 F.2d 1382, 165 USPQ 494 (CCPA 1970). All claim limitations, including those which are functional, must be considered. See In re Oelrich, 666 F.2d 578, 212 USPQ 323 (CCPA 1981). Hence, all words in a claim must be considered in deciding the patentability of that claim against the prior art. Each word in a claim must be given its proper meaning, as construed by a person skilled in the art. Where required to determine the scope of a recited term, the disclosure may be used. See In re Barr, 444 F.2d 588, 170 USPQ 330 (CCPA 1971).

In the present situation, Yura '727 fails to disclose and suggest key features of Applicants' base claims 1 and 11. Therefore, Applicants respectfully request that the rejection of claims 1 and 11 and their respective dependents be withdrawn.

On page 3 of the Office Action (Paper No. 6), the Examiner seems to acknowledge the fundamental differences between the subject matter of Yura '727 and the subject matter of Applicants' claims 1-20. Nevertheless, the Examiner asserts that "producing a compensation value for changing the torque command so that detected excitation current is smaller than targeted limitation" is inherent.

However, inherency requires certainly, not speculation. The fact that a certain characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that characteristic. In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); and In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ 322, 326 (CCPA 1981). To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). In relying upon the theory of inherency, the Examiner must provide a basis in fact and technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Ex Parte Levy, 17 USPQ 2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

In the present situation, there is simply **no** basis in fact for the Examiner to assert that Yura '727 contains Applicants' key features, including the "torque boost voltage command unit for producing a torque boost voltage command according to an inverter frequency command" and the "torque boost voltage compensation unit for changing said torque boost voltage command so that the detected excitation current

value is smaller than or equal to said limitation level" as defined in Applicants' base claims 1 and 11.

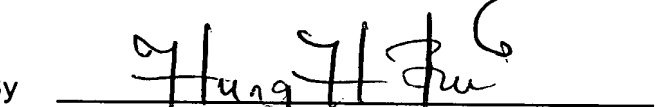
Claims 21-26 have been newly added to alternatively define Applicants' disclosed invention over the prior art of record. These claims are believed to be allowable at least for the same reasons discussed against all the outstanding rejections of the instant application. No fee is incurred by the addition of claims 21-26.

In view of the foregoing amendments, arguments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. Should any questions remain unresolved, the Examiner is requested to telephone Applicants' attorney at the Washington DC area office at (703) 312-6600.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage of fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, No. 01-2135 (Application No. 500.41509X00), and please credit any excess fees to said deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

By 

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